PROGRAM TASK LISTING EFFECTIVE DATE: June 30, 1995

PROGRAM AREA: Technology Education

PROGRAM TITLE: Manufacturing Systems I

IDAHO CODE NUMBER: TE 1931

05.01 Demonstrate the ability to work safely with a variety of technologies.

05.02 Demonstrate interpersonal skills as they relate to the workplace.

05.03 Identify and apply methods of information acquisition and utilization.

05.04 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.

05.05 Demonstrate and apply design/problem-solving processes.

05.06 Express an understanding of technological systems and their complex interrelationships.

05.07 Demonstrate the ability to properly identify, organize, plan, and allocate resources.

05.08 Discuss individual interests and aptitudes as they relate to a career.

05.09 Demonstrate employability skills and habits.

05.10 Demonstrate an understanding of entrepreneurship.

05.11 Make an informed and meaningful career choice.

05.12 Demonstrate technological literacy about manufacturing systems.

05.13 Demonstrate knowledge of the advancement and history in manufacturing.

05.14 Describe types of organization, ownership and management systems.

05.15 Describe types of production systems.

05.16 Demonstrate knowledge of research and development techniques.

05.17 Demonstrate knowledge of financial aspects.

05.18 Demonstrate knowledge of industrial relations.

05.19 Demonstrate knowledge of characteristics of various materials and natural resources used in manufacturing.

05.20 Demonstrate use of traditional and innovative equipment.

05.21 Demonstrate knowledge of material processing and recycling.

05.22 Demonstrate procedures of converting energy.

05.23 Demonstrate knowledge of production planning.

05.24 Demonstrate marketing techniques.

05.25 Demonstrate knowledge of free enterprise systems.

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05.01 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--
The student will be able to:

1. Select appropriate tools, procedures, and/or equipment needed to produce a product.
2. Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
3. Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
4. Follow laboratory safety rules and procedures.
5. Demonstrate good housekeeping at work station within total laboratory.
6. Identify color-coding safety standards.
7. Explain fire prevention and safety precautions and practices for extinguishing fires.
8. Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

05.02 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--
The student will be able to:

1. Perform roles in a student personnel system or in the Idaho Technology Student Association (ID-TSA).
2. Participate as a member of a team.
3. Teach others new skills.
4. Identify skills needed to serve clients/customers.
5. Demonstrate leadership skills.
6. Describe strategies necessary for negotiating agreements.
7. Demonstrate the application of skills necessary to work with people of diverse backgrounds.
8. Form an understanding and appreciation for work after listening to or observing technology workers.
9. Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
10. Form an understanding and appreciation for the roles and work of co-workers.

05.03 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATION-
The student will be able to:

1. Define terms related to computers.
2. Identify and describe methods of information acquisition and evaluation.
3. Discuss advantages and disadvantages in the application of technologies.
4. Produce a plan to organize and maintain information relevant to emerging technologies.
5. Comprehend and communicate information relevant to emerging technologies.
6. Demonstrate the use of computers to process information.

05.04 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

1. Identify and explain the main and subordinate ideas in a written work.
2. Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
3. Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
4. Distinguish fact from opinion.
5. Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
6. Select, relate, and organize ideas using outlining and/or graphic organizers

and develop the ideas in coherent paragraphs.

7. Improve one's own writing by restructuring, correcting errors, and rewriting.
8. Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
9. Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
10. Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
11. Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
12. Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
13. Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
14. Use the mathematics of:
    - integers, fractions, and decimals;
    - ratios, proportions, and percentages;
    - roots and powers;
    - algebra- geometry.
15. Make estimates and approximations, and judge the reasonableness of a result.
16. Use elementary concepts of probability and statistics.
17. Draw, read, and analyze graphs, charts, and tables.
18. Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
19. Organize and communicate the results obtained by observation and experimentation.
20. Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
21. Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.05 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

1. Describe and explain steps in the design/problem-solving process.
2. Propose solutions to given problems.
3. Design and implement the optimal solution to a given problem.
4. Document each step of the design/problem-solving process.

5. Demonstrate "Brainstorming" as a process to solve problems.
6. Define "critical thinking" and its value in the problem-solving process.

05.06 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

1. Demonstrate knowledge of how social, organizational, and technological systems work.
2. Explore methods used to monitor and correct performance of technological systems.
3. Design and implement an optimal solution to a given problem.
4. Outline major historical technological developments or events.
5. Identify recent advances in technology.
6. Explain problem-solving roles of technology.
7. Forecast a technological development or event.
8. Define technology.

05.07 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

1. Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
2. Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
3. Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
4. Display knowledge of the efficient use of human resources.

05.08 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

1. Describe individual strengths and weaknesses.
2. Discuss individual interests related to a career.
3. Identify careers within specific areas of technology.
4. Explore careers within specific areas of interest.

05.09 DEMONSTRATE EMPLOYABILITY SKILLS AND HABITS--
The student will be able to:

1. Identify employment opportunities.
2. Apply employment seeking skills.
3. Interpret employment capabilities.
4. Demonstrate appropriate work behavior.

5. Maintain safe and healthy environment.
6. Maintain businesslike image.
7. Maintain working relationships with others.
8. Communicate on the job.
9. Adapt to change.
10. Demonstrate knowledge of manufacturing.
11. Perform mathematical calculations.
12. Compile a portfolio.

05.10 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

1. Define entrepreneurship.
2. Describe the importance of entrepreneurship to the American economy.
3. List the advantages and disadvantages of business ownership.
4. Identify the risks involved in ownership of a business.
5. Identify the necessary personal characteristics of a successful entrepreneur.
6. Identify the business skills needed to operate a small business efficiently and effectively.

05.11 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

1. Make a tentative occupational choice based on the information learned and interest developed in this course.
2. Review tentative occupational choices based on the information learned and interest developed in this course.

05.12 DEMONSTRATE TECHNOLOGICAL LITERACY ABOUT MANUFACTURING SYSTEMS--
The student will be able to:

1. Define manufacturing technology.
2. Outline major technological developments and events in the history of manufacturing systems technology.
3. Identify recent advances in manufacturing technology.
4. Forecast a development or event in manufacturing technology.

05.13 DEMONSTRATE KNOWLEDGE OF THE ADVANCEMENT AND HISTORY IN MANUFACTURING--
The student will be able to:

1. Illustrate and recall the history of the home handicraft system, era.
2. Analyze the history and events of the mercantile system.
3. Report, employ and test various machines that are used in the

manufacturing systems.

4. Demonstrate, experiment and construct various mass production sequences.
5. Recognize and demonstrate different types of factory systems.
6. Research, employ, diagram, prepare and assess different assembly line techniques.
7. Explain, operate and propose the advantages and disadvantages of computers and automation in manufacturing production systems.

05.14 DESCRIBE TYPES OF ORGANIZATION, OWNERSHIP AND MANAGEMENT SYSTEMS--

The student will be able to:

1. Identify, practice and compare the business and manufacturing aspects of sole proprietorship.
2. Define, discuss, apply and examine the functions of partnerships.

05.15 DESCRIBE TYPES OF PRODUCTION SYSTEMS--

The student will be able to:

1. Dramatize, compare and design a custom manufacturing system.
2. Identify, employ and create an intermittent manufacturing system.
3. Demonstrate, appraise and manage a continuous manufacturing system.

05.16 DEMONSTRATE KNOWLEDGE OF RESEARCH AND DEVELOPMENT TECHNIQUES--

The student will be able to:

1. Discuss and demonstrate the steps in problem solving.
2. Relate, review, apply and test techniques used in basic research.
3. Define, discuss, interpret and arrange the principles demonstrated in applied research.

05.17 DEMONSTRATE KNOWLEDGE OF FINANCIAL ASPECTS--

The student will be able to:

1. Identify, analyze and organize the various aspects needed for capital resources.
2. Illustrate and practice the accounting techniques used in manufacturing.
3. Employ and plan the procedures involved in the purchasing aspects of manufacturing.
4. Analyze, collect and evaluate data researched and collected from marketing practices applied in manufacturing.

05.18 DEMONSTRATE KNOWLEDGE OF INDUSTRIAL RELATIONS--
The student will be able to:

1. Relate, report and dramatize the different situations involved in industrial relationships.
2. List, explain and compose the various facets of employee relations in a manufacturing enterprise.
3. Define, express and set up the different situations involved in public relations with their customers.

05.19 DEMONSTRATE KNOWLEDGE OF CHARACTERISTICS OF VARIOUS MATERIALS AND NATURAL RESOURCES USED IN MANUFACTURING--
The student will be able to:

1. Describe the science of materials, including their properties.
2. Define, discuss, apply, experiment, create and appraise the various methods of operation and uses for woods, metals, plastics, composites, biotechnology and natural resources.

05.20 DEMONSTRATE USE OF TRADITIONAL AND INNOVATIVE EQUIPMENT--
The student will be able to:

1. Identify and describe tools used in the manufacturing process.
2. Identify and describe the six basic machines used in manufacturing.
3. Demonstrate the safe operation of selected machines used in the manufacturing lab.

05.21 DEMONSTRATE KNOWLEDGE OF MATERIAL PROCESSING AND RECYCLING--
The student will be able to:

1. Define, identify and illustrate the three basic processes in material processing.
2. Illustrate the proper practice and tests for thermal forming, magnetic forming, chemical forming and natural forming.
3. Demonstrate the proper practice and experiments for mechanical separating, chemical separating and electrical separating.
4. Employ the proper practice and experiments for mechanical combining, electrical combining, chemical combining, alloys and composites.

05.22 DEMONSTRATE PROCEDURES OF CONVERTING ENERGY--
The student will be able to:

1. Identify, apply and test methods of converting electrical energy (hydro, chemical, innovative methods...etc.).

2. Recognize, employ and experiment with methods of converting mechanical energy (steam, internal combustion engine, innovative methods...etc.).
3. Describe, illustrate and test methods of converting chemical energy (coal, batteries, petroleum, natural gas, innovative methods...etc.).

05.23 DEMONSTRATE KNOWLEDGE OF PRODUCTION PLANNING--
The student will be able to:

1. Define and assess steps in production planning in specific areas of market analysis, research and development, organizational structures, production, distribution and customer relation/product evaluation.
2. Describe the quality control engineering processes.

05.24 DEMONSTRATE MARKETING TECHNIQUES--
The student will be able to:

1. Recall, report, practice and create proper techniques and strategies that will benefit their student manufacturing organization in creating and analyzing market demand, competition, market performance, consumer and market surveys.
2. Describe advertising methods.
3. Describe sales techniques.
4. Describe packaging procedures.
5. Describe shipping procedures associated with marketing products.

05.25 DEMONSTRATE KNOWLEDGE OF FREE ENTERPRISE SYSTEMS--
The student will be able to:

1. Explain, compare and evaluate the types of free enterprise systems.
2. Explaining the advantages and disadvantages of the common economic systems.